MULTI-DIMENSIONAL DATA INTERLEAVING COMMUNICATIONS SYSTEM AND METHOD

ABSTRACT OF THE DISCLOSURE

An interleaving operation can scramble (permute) a data stream, or each dimension (set of symbols (a, b, c, ...)) in a data stream, immediately following FEC encoding or dimension multiplexing of the data stream. Bursts of errors might be combined with the permuted data before, during, or after transmission. A de-interleaver reorders the received symbols and, in the process, spreads (separates) the bursts of errors. Also, using the multi-dimensional interleaving and de-interleaving can balance SNR on each channel. Spreading the errors and/or balancing SNR can keep bursts from overwhelming the FEC decoder or an FEC decoder in any one channel. In one example, interleaving and de-interleaving can be used to scramble data over Ethernet twisted wire pairs. In another example, interleaving and de-interleaving can be used to scramble data or information broadcast via wireless telecommunications channels (e.g., radio frequency channels, multi-antenna channels, etc).

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